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**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Reissue Application of:	U.S. Patent No. 5,788,864	Atty. Docket No.:	9323.00001
Issued:	August 4, 1998	Group Art Unit:	1761
Application No.:	09/632,812	Examiner:	Chester T. Berry
Filed:	August 4, 2000		
For:	AMINE HEAT STABLE SALT REMOVAL FROM TYPE II ANION EXCHANGE RESIN		

**STATUS INQUIRY**

**CUSTOMER WINDOW, MAIL STOP REISSUE**

U.S. Patent and Trademark Office  
220 20<sup>th</sup> Street S.  
Crystal Plaza Two, Lobby, Room 1B03  
Arlington, VA 22202

Sir:

Applicants request an update on the status of the above-identified application. A Response to Non-Compliant Amendment submitting a revised Listing of Claims was filed on August 6, 2004. For the Examiner's convenience, a courtesy copy of the response filed and the stamp receipt postcard is attached.

Please advise us of the status of the above-identified application, including an indication as to when the next communication can be expected. We look forward to your reply.

Respectfully submitted,

Date: November 3, 2004

By: William J. Fisher

William J. Fisher  
Registration No. 32,133

Banner & Witcoff, Ltd.  
1001 G Street, N.W.  
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Attachment: Response filed August 6, 2004



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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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U.S. Patent No. 5,788,864

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For:                   AMINE HEAT STABLE SALT REMOVAL  
FROM TYPE II ANION EXCHANGE RESIN

**RESPONSE TO NON-COMPLIANT AMENDMENT**

**CUSTOMER WINDOW, MAIL STOP REISSUE**

U.S. Patent and Trademark Office  
220 20<sup>th</sup> Street S.  
Crystal Plaza Two, Lobby, Room 1B03  
Arlington, VA 22202

Sir:

In response to the Notice of Non-Compliant Amendment mailed March 9, 2004, Applicant submits herewith a replacement "Listing of Claims" portion of the Amendment filed on September 10, 2003. It is believed that the submission of the revised Listing of Claims is in full compliance with the rules under 37 C.F.R. §§ 1.121(b) (ii) and 1.121(b)(iii). Applicants petition for a four (4) month extension of the term and authorizes the charging of the \$1,480 fee to our Deposit Account No. 19-0733.

Respectfully submitted,

**COPY**

Date: August 6, 2004

By: William J. Fisher  
William J. Fisher  
Registration No. 32,133

Banner & Witcoff, Ltd.  
1001 G Street, N.W.  
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(202) 824-3000  
Attachment: Listing of Claims

**Listing of Claims:**

Claim 1 (previously presented) A process for regenerating a Type II strong base anion exchange resin comprising:

passing an alkanolamine solution, whose effectiveness at removing H<sub>2</sub>S and CO<sub>2</sub> from gas streams has been decreased by the accumulation of heat stable salts, through a bed of Type II strong base anion exchange resin until the active anion exchange sites of said Type II strong base anion exchange resin are loaded with heat stable salt anions; and

contacting said loaded Type II resin with an amount of an alkali metal hydroxide and for a time sufficient to obtain recovery of over 50% of the virgin capacity of the loaded Type II resin.

Claim 2 (previously presented) The process according to claim 1 wherein said heat stable salt anion is SCN<sup>-</sup>.

Claim 3 (previously presented) The process according to claim 1 wherein said alkali metal hydroxide is sodium hydroxide.

Claim 4 (previously presented) The process according to claim 3 wherein the amount of sodium hydroxide is from about 1 to about 40 pounds of NaOH equivalent per cubic foot of resin.

Claim 5 (previously presented) A process for regenerating a Type II strong base anion exchange resin comprising:

passing an alkanolamine solution, whose effectiveness at removing H<sub>2</sub>S and CO<sub>2</sub> from gas streams has been decreased by the accumulation of heat stable salts, through a bed of Type II strong base anion exchange resin until the active anion exchange sites of said Type II strong base anion exchange resin are loaded with heat stable salt anions;

contacting said loaded Type II resin with an amount of an alkali metal hydroxide and for a time sufficient to obtain recovery of over 50% of the virgin capacity of the loaded Type II resin; and

repeating the steps of loading said Type II resin with said anions and regenerating repeatedly without substantial further reduction in active anion exchange sites.

Claim 6 (previously presented) The process according to claim 5 wherein said heat stable salt anion is  $\text{SCN}^-$ .

Claim 7 (previously presented) The process according to claim 5 wherein said alkali metal hydroxide is sodium hydroxide.

Claim 8 (previously presented) A process consisting of:

loading a Type II strong base anion exchange resin with  $\text{SCN}^-$ ;

washing said Type II anion resin with water;

regenerating said Type II anion exchange resin in a single step with a solution of sodium hydroxide having a concentration of from about 1% to about 15% by weight of sodium hydroxide at a temperature of from about 70°F. to about 120°F. in an amount of NaOH from about 5 to about 35 pounds per cubic foot for from about 5 to about 120 minutes to remove heat stable anions from said resin to obtain recovery of over 50% of the virgin capacity of the loaded Type II resin; and

washing said Type II anion exchange resin with water.

Claim 9 (currently amended) A cyclic process for purifying an aqueous alkanolamine solution containing alkali metal salts of anions which form heat stable salts with alkanolamines, heat stable salts of such anions with alkanolamines, or both, comprising:

- (a) contacting the aqueous alkanolamine solution with a Type II strong base anion exchange resin to transfer at least some heat stable salt anions from the solution to the resin;
- (b) regenerating the resin by contacting the resin with an alkali metal hydroxide so that the alkali metal hydroxide removes from the resin substantially all the same quantity of heat stable salt anions transferred to the resin in step (a); and
- (c) repeating steps (a) and (b).

Claim 10 (previously presented) The process according to claim 9 wherein said alkali metal hydroxide is sodium hydroxide.

Claim 11 (previously presented) The process according to claim 9 wherein said aqueous alkanolamine solution is approximately 40% by weight alkanolamine.

Claim 12 (currently amended) A process for purifying an aqueous alkanolamine solution containing alkali metal salts of anions which form heat stable salts with alkanolamines, heat stable salts of such anions with alkanolamines, or both obtained from contacting the aqueous alkanolamine solution with a hydrocarbon gas stream containing acid gasses, comprising:

- (a) contacting the aqueous alkanolamine solution with a Type II strong base anion exchange resin to transfer at least some heat stable salt anions from the solution to the resin;
- (b) recirculating the aqueous alkanolamine solution recovered from step (a) to contact the hydrocarbon gas stream containing acid gasses;
- (c) regenerating the resin by contacting the resin with an alkali metal hydroxide so that the alkali metal hydroxide removes from the resin substantially all the same quantity of heat stable salt anions transferred to the resin in step (a); and
- (d) repeating steps (a) - (c).

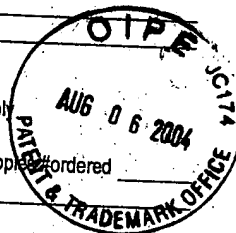
Claim 13 (New) The method of claim 9, wherein the heat stable salts comprise thiocyanate.

Claim 14 (New) The method of claim 12, wherein the heat stable salts comprise thiocyanate.



COPY

☒ PATENT ☐ DESIGN B&W Ref. 9323.00001 Date: 8-6-04  
☐ HAND CARRY Group/Section \_\_\_\_\_ Bldg \_\_\_\_\_ Rm \_\_\_\_\_  
Serial/Patent No.: 09/632,812/5,788,864 Atty/Sec: WTF/BAO  
Inventor: S. Coberly et al. Client: MPR  
Title: Amine Heat Stable Salt Removal From  
Type II Anion Exchange Resin  
The following has been received in the U.S. Patent and Trademark Office on the date stamped hereon:  
☐ \_\_\_\_\_ total pp Spec., including : # of Claims \_\_\_\_\_  
# of independent claims \_\_\_\_\_ ☐ Abstract ☐ Request for Corrected : ☐ Filing Receipt ☐ Assignment  
☐ Application Data Sheet (ADS): ☐ Initial ☐ Supplemental ☐ Response to Restriction/Election Requirement  
☐ Drawings: ☐ Formal ☐ Informal ☐ Sequence Listing: ☐ Diskette ☐ Paper \_\_\_\_\_ pages  
# of distinct sheets \_\_\_\_\_ Figs: \_\_\_\_\_  
☐ Amendment ☐ Response : OA  
☐ Nonpublication Request ☐ Petition for Extension of Time until \_\_\_\_\_  
☐ Declaration/Power of Attorney: ☐ Executed ☐ Unexecuted ☐ RCE ☐ w/Ext of Time : OA did \_\_\_\_\_  
☐ Assignment w/PTO Cover Sheet ☐ Request for Approval of Drawing Changes  
☐ IDS w/PTO 1449 ☐ References ☐ w/Fee ☐ Notice of Appeal & Fee  
☐ Preliminary Amendment ☐ Brief : ☐ Appeal & Fee ☐ Reply \_\_\_\_\_  
☐ Priority Claim: (Foreign or U.S. Provisional) B&W# \_\_\_\_\_ ☐ Request for Oral Hearing  
☐ Issue Fee ☐ Pub. Fee ☐ Adv. Pat. Copies ordered \_\_\_\_\_  
Notice of Allowance did \_\_\_\_\_  
Country \_\_\_\_\_ Appl. # \_\_\_\_\_ Date \_\_\_\_\_  
☐ w/Foreign Priority Document(s) ☐ Amendment under 37 CFR 1.312  
☐ Application: ☐ CIP ☐ Continuation ☐ Divisional ☐ Request for Certificate of Correction  
Parent SN: \_\_\_\_\_ B&W# \_\_\_\_\_ ☐ Transmittal ☐ Fee Transmittal w/Auth. to Charge Deposit Acct.  
☐ U.S. Provisional \_\_\_\_\_ pp Spec/Claims; Cover Sheet ☐ Certificate of Mailing  
☐ Response to Missing Parts/Requirements did \_\_\_\_\_ ☐ Check No. \_\_\_\_\_ for \$ \_\_\_\_\_  
☐ Response to Notice to File Corrected Appl. Papers did \_\_\_\_\_  
☐ Request for Expedited Foreign Filing License



☒ Response to Non-Compliant Amendment  
☒ Submission of Executed Supp. Declaration  
☒ and Surrender of Original Letter Patent  
Attachments: executed Declaration  
original Letters Patent 5,788,864